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ABSTRACT

A study examined the effects of visual-verbal redundancy and recaps on learning from television news. Two factors were used: redundancy between the visual and audio channels, and the presence or absence of a recap. Manipulation of these factors created four conditions: (1) redundant pictures and words plus recap, (2) redundant pictures and words with no recap, (3) nonredundant pictures and words plus recap, and (4) nonredundant pictures and words with no recap. Subjects, 80 undergraduate students, were randomly assigned to one of the four conditions. The five selected network news stories showed redundancy between the audio and visual channels. The introductions of the stories were transcribed and read by a news anchor for a local TV channel. To manipulate nonredundancy conditions, each story's camera shots were reedited within that story, disrupting the synchronization between pictures and words. To create the recap conditions, the anchorman summarized the main point of each story immediately afterward. Subjects were asked to show story understanding by stating the central point of each story and answering a multiple choice test. Analysis of the results showed the superiority of visual-verbal redundancy over recapping.
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Radio-TV Journalism Division

The Effects of Visual-Verbal Redundancy and Recaps on Television News Learning

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ABSTRACT

The Effects of Visual-Verbal Redundancy
and Recaps on Television News Learning

by

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An experiment was designed to examine the effects of both visual-verbal redundancy and recaps on learning from television news. A 2 x 2 factorial design was employed. Two factors were redundancy between the visual and audio channels, and the presence or absence of recap. Manipulating these factors created four conditions: (1) redundant pictures and words, and recap, (2) redundant pictures and words, and no-recap, (3) nonredundant pictures and words, and recap, and (4) nonredundant pictures and words, and no-recap.

Twenty University of Texas at Austin undergraduates were randomly assigned to each of the four conditions (N=80). Five network news stories were selected which showed redundancy between the visual and audio channels. The introductions of the stories were transcribed and read by an anchorman for a local TV channel. To manipulate nonredundancy conditions, each story's camera shots were reedited within that story -- disrupting the synchronization between pictures and words. To create the recap conditions, the anchorman summarized the main point of each story immediately afterwards.

Subjects were asked to show story understanding by reproducing the central point of each story. They were also asked to show story recall by answering a multiple-choice test. MANOVA for a dummy story showed no significant differences between the groups. MANOVA for the four manipulated stories showed a significant effect of visual-verbal redundancy on learning. However, t-test showed a significant difference between the redundancy groups and the nonredundancy groups on recall only. The results showed the superiority of visual-verbal redundancy over recapping.

The Effects of Visual-Verbal Redundancy and Recaps on Television News Learning

Growing numbers of studies on learning from television newscasts show that viewers recall little of the content. Neuman (1976) discovered that half of his subjects could not recall a specific news story unaided. Katz, Adoni and Parness (1977) found that one-fifth of television viewers could not recall spontaneously even one item. Stauffer, Frost and Rybolt (1981) also found low levels of recall.

These findings suggest that television news editors should consider some strategies for making news stories more comprehensible and memorable. The purpose of this study is to investigate two such strategies which may make news stories easier to understand and recall. In particular, this study will examine the effects of both visual and verbal redundancy on learning from television news.

Television news editors often rely on visuals to provide the context for stories. The impact of visuals has long been of interest to researchers involved with television news. Jorgensen (1955) conducted the pioneer study in which he found no significant difference in information gain between a newscaster alone and a newscaster speaking over film. Further, he found that viewers liked the newscaster alone more than the film treatment. He found, however, that film produced significantly more information gain than did the newscaster with still

pictures. McDaniel (1973) found inconsistent effects of film on information gain. He suggested that film impact is dependent on story content, and that it might help learning in stories which have redundant between the audio and video channels. Edwardson, Grooms and Pringle (1976) found subjects remembered stories with film no better than stories presented by a newscaster alone.

Gunter (1979) found that free recall of brief news items was significantly influenced by visual presentation format. He found, in particular, that news items accompanied by film-clips were recalled significantly better than still items or talking-head items. Gunter (1980) reported that overall learning was slightly, though not significantly, poorer from stories accompanied by picture materials than from those presented by the newscaster alone. He explained that the physical presence of film or other pictorial elements does enhance attention to and retention of news headlines when an audience is exposed to a sequence of brief news reports; however, learning at a deeper level is more likely to be adversely affected by dynamic visualizations. He suggested that the precise influence of picture materials on learning from televised informational sequences depends upon the nature of the learning task.

The cue summation theory discussed by Hsia and Jester (1968) hypothesizes that presentation of irrelevant cues in either the visual or audio channels will cause a loss of learning from the other channel, but when audio and visual information is complementary, greater overall learning will take place. Severin

(1967) tested this cue summation theory and found that the degree of irrelevancy of cues in one channel to information in the other has important effects upon overall learning, with slightly irrelevant cues often causing more distraction than extremely irrelevant cues.

More recently, Drew and Reese (1984) found that film helped children remember stories, and that students understood more of the stories presented with film than those presented without. Reese (1984) found that learning from news stories was greater when visuals and script were redundant than when they were not. He suggested, however, that adding redundant print information impeded learning. Drew and Grimes (1985) found that the higher the visual-verbal redundancy, the more audio information subjects could recall and the greater the understanding of stories.

While these studies suggest a beneficial effect of redundant visuals on learning from television news, related film may not be easy to obtain in practice. For example, in reporting international news events it may be impossible to get good visuals on time. To compensate for this lack the editor might consider employing alternative ways to make news stories easier to understand and recall.

Recapping the news, or repeating the most important facts, may be an alternative source of redundancy. It seems reasonable to predict that learning would be increased when newscasts recap important elements of each news story. Perloff et al. (1982) tested this expectation, and found that several sentences

recapping the news stories enhanced viewers' recall of story content. However, they suggested that recaps should be used in conjunction with other techniques because simple recaps are clearly insufficient. Bernard and Coldevin (1985) investigated the effects of short, headline-type recaps on the recall of specific information and the gist of the stories in a television news program. They found that recaps increased retention of the gist of the stories, but did not affect retention of specific details. They did not find any difference between oral recap and oral-plus-graphic recap, and concluded that recapping is a simple and effective technique for directing postviewing attention toward particular news program content.

Thus, studies on learning from television newscasts have tested the effects of strategies for making stories easier to recall and to understand separately, and have showed contradictory results. Bloom (1956) made a distinction between recall and understanding. He explained that knowledge implies recall or recognition of myriad inconsequential details, with no understanding or systematization of those details; comprehension suggests that the learner "understands" -- or internalizes and systematizes the "knowledge." He further classified knowledge and comprehension into different categories for educational objectives to be measured in different ways.[1] It seems reasonable to measure the effects of visual-verbal redundancy and recaps (verbal redundancy) on recall and understanding separately.

However, the findings mentioned above raise a doubt as to whether recapping is an effective technique of improving viewers' learning from the stories. Is recapping as effective as visual-verbal redundancy? To examine the effect of recaps and to confirm the effects of visual-verbal redundancy, this study will test the following hypotheses:

- H1: A newscast with story recaps will lead to more understanding than a newscast with no-recaps.
- H2: A newscast with story recaps will lead to more recall than a newscast with no-recaps.
- H3: A newscast with redundancy between pictures and words will lead to more understanding than a newscast with nonredundancy between pictures and words.
- H4: A newscast with redundancy between pictures and words will lead to more recall than a newscast with nonredundancy between pictures and words.

Method

Data for this study were gathered in the fall of 1985 using undergraduate students at the University. The experiment employed a 2 x 2 factorial design. The two factors were redundancy between the visual and audio channels, and the presence or absence of recap. Manipulating these factors created four news message conditions: (1) redundant pictures and words, and recap, (2) redundant pictures and words, and no-recap, (3) nonredundant pictures and words, and recap, and (4) nonredundant pictures and words, and no-recap.

Procedure

Several viewing sessions were set up over four days during the first and second week of December 1985. Subjects (N=80) were asked to sign for a viewing session, and then each of these groups was randomly assigned to one of the four experimental treatments. Each viewing session took place in a quiet classroom. The total viewing time was 8 minutes 19 seconds to 10 minutes 19 seconds depending on the condition.

In each condition, subjects were told they were participating in a study of television news, and they would be shown a newscast. They were instructed that they should pay no more or less attention to the newscast than they usually do. After the newscast ended, a questionnaire testing for understanding was distributed. Afterwards, the subjects completed a mathematical quiz, requiring 5 minutes. The math quiz was used to purge short-term memory of the story information. The subjects then were asked to answer multiple-choice questions about the stories.

Materials

[Development of Stimulus Materials] Several early evening network news programs were videotaped in September, 1985, with five stories retained for the experiment -- four to be manipulated and one to act as a "dummy" story. The criteria in choosing stories were how well the visual and audio channels match and how well the stories were known. The stories which showed redundancy between the visual and audio channels and which were not highly familiar were selected.

The first story was a story about the Greenpeace scandal, which upset the government of France. The second story was about an incident of Arabic and Israeli violence in Cyprus. The third story was about a speech by the President of South Africa. The fourth story was about American Airlines on which the FAA had imposed a record fine. The final story, the dummy story, was a story about George Blanksten, a man mistakenly declared dead by the Social Security bureaucracy.

[Experimental Manipulations] For the four stories for which variables were manipulated, the introductions were transcribed and read by an anchorman for a local TV channel. The correspondents' report followed the introductions so as to simulate a newscast. To manipulate nonredundancy conditions, each story's camera shots were reedited within that story -- disrupting the synchronization between pictures and words. To create the recap conditions, the anchorman summarized the main point of each story immediately afterwards. Overall, the recaps added about 24.4 % to the total news presentation time (2 minutes).

Instrumentation

Two dependent variables were used in the study. Understanding was measured by asking open-ended questions about the central points of the stories. Using a similar technique to Sahin et al. (1981), this study defined the central points as listed below, and open-ended responses were coded according to their correspondence with those points.[2]

1. While French Prime Minister Fabius denied he had advance knowledge of the order to sink the Rainbow Warrior, 44 % of the French public believed the President knew about the order.

2. Three Palestinian gunmen seized a yacht and killed 3 Israelis in Cyprus, demanding the release of about 20 Palestinians seized at sea. However, the PLO denied any involvement.

3. President Botha of South Africa presented a package of what his government will consider in Apartheid reform, due to the pressure from business community. Bishop Tutu was skeptical of the proposal.

4. The FAA ordered American Airlines to pay a record one-and-a-half-million dollar fine for a number of maintenance violations. American Airlines held the previous record of paying the largest fine.

5. George Blanksten, who was dead through a computer error in the social security system, was brought back from the dead by Mike Royko's column.

Recall was measured by asking multiple-choice questions about each story. The items focused on important concepts and facts central to the story. For each question there was one correct answer, although several plausible alternatives were constructed. Subjects could respond "don't know." For each story, recall was the number of correct answers. Twenty-five items were selected among 35 items pretested for reliability.[3]

Analysis

Multivariate analysis of variance was performed to test for overall significance. Then, t-test was performed to test hypotheses. Rejecting the null hypothesis required significant effects at the .05 level.

Results

MANOVA for the George Blanksten dummy story showed no significant differences between the groups. The main effect for visual-verbal redundancy manipulation, the main effect for recaps manipulation, and the interaction effects of visual-verbal redundancy and recaps on learning were not significant (F values = 1.22, 0.75 and 0.18; df=2,75; n.s). These results indicate that random assignment succeeded in making the groups equivalent.

Further analyses are for the four manipulated stories. Mean understanding and recall scores for the four conditions are presented in Table 1.

Table 1, 2 about here

As seen in Table 2, data analysis with MANOVA showed a significant effect of visual-verbal redundancy on learning ($F=4.73$; $df=2,75$; $p<.05$). However, neither the main effect for recaps, nor the interaction of visual-verbal redundancy and recaps on learning, were significant ($F=2.67$, 0.81; $df=2,75$; n.s). This result does not support H1 and H2, which predicted positive effects of recaps on understanding and recall.

A t-test on each dependent variable was performed for the visual-verbal redundancy manipulation only. The results are presented in Table 3. While the mean understanding score of nonredundancy groups was 5.125, that of redundancy groups was 4.875. However, there were no significant difference between the

redundancy groups and the nonredundancy groups (t=0.88, df=78, n.s, one-tailed). The result does not support H3, that a newscast with visual-verbal redundancy will lead to more understanding than a newscast without.

Table 3 about here

However, a t-test on recall scores showed a significant difference between the redundancy groups and the nonredundancy groups on recall (t=-2.69, df=78, $p<.05$, one-tailed). The mean recall score (11.175) of redundancy groups was higher than that of nonredundancy groups (9.5). The result supports H4, that a newscast with redundancy between pictures and words will lead to more recall than a newscast without. Overall, H1, H2, and H3 were not supported but H4 was supported.

Discussion

The results indicate that redundancy between pictures and words significantly affects recall of television news stories, but not story understanding. These results confirmed Reese's findings. The redundancy manipulation was similar to that in his experiment, which used long stories with video broadly related to audio. Although both this study and that of Drew and Grimes showed beneficial effects of visual-verbal redundancy, this study found differences only for recall and not understanding while theirs found differences in both. Consequently, these results suggest that stories vary as to how they benefit from

visual-verbal redundancy. Depending on the types of stories, the effect of redundancy between pictures and words remains within the scope of recall, or can reach beyond the scope of recall to understanding.

The findings in this experiment suggest that recapping is not an effective technique of increasing viewers' learning from television news. This result was contrary to Perloff et al.'s findings but confirmed Bernard and Coldevin's results. Perloff et al. found that several sentences recapping the news stories enhanced viewer's recall of story content. Bernard and Coldevin found that headline-type recapping did not provide viewers with better memory for the specific factual details of a news program. The measure of specific information retention in the study of Bernard and Coldevin seems similar to the measure of recall in this experiment. Though the use of several sentences recapping the news stories in this experiment was different from headline-type recapping, the results were the same -- that recapping does not improve viewers' recall.

Visual-verbal redundancy and recapping have been considered as two major factors which affect learning from television news. Prior to this study, because the effect of visual-verbal redundancy and the effect of recapping had never been tested in the same experiment, it was impossible to compare the relative power. However, when the effects of visual-verbal redundancy and recaps were tested at the same time, the results clearly showed the superiority of visual-verbal redundancy over recapping.

Though recapping gives viewers one more chance to listen to the central point of the story, the effect of recaps on understanding and recall was not significant. This finding was surprising. One explanation may be that viewers are not accustomed to hearing recapping so that they did not pay much attention to the repeated message. They may have noticed its similarity to the story and tuned it out.

This study confirmed that redundancy between pictures and words is a key factor in making news stories easier to recall. Future study should be focused on more specific visual-verbal redundancy strategies in order to increase learning from television news.

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Table 1: Mean Understanding and Recall Scores for Effects of Visual-Verbal Redundancy and Recaps

	Understanding		Recall	
Recap :	Present	Absent	Present	Absent
Redundancy:				
High	5.10	4.65	11.20	11.15
Low	5.50	4.75	10.30	8.70

Table 2: Summary of MANOVA for the Manipulated Stories on Dependent Variables of Understanding and Recall

Source	Wilks Lambda	F	df
Redundancy	.888	4.73 *	2,75
Recap	.933	2.67	2,75
Redundancy x Recap	.979	.81	2,75

* $p < .05$

Table 3: Mean Understanding and Recall Scores for Redundancy Groups and Nonredundancy Groups

	Visual-Verbal Redundancy		
	Low	High	T value
Understanding	5.125 N=40	4.875 N=40	0.877
Recall	9.5 N=40	11.175 N=40	-2.688 *

* $p < .05$ (one-tailed t-test)

Notes

[1] In Bloom's taxonomy of educational objectives -- cognitive domain, recall is classified into the first category while understanding is classified into the second category, the higher category.

[2] For each story the central point became the midpoint on a three-point scale. The absence of that central point or providing additional details was ranked below and above the midpoint, respectively. A random sample of questionnaires was checked by a second coder and a coefficient of reliability was computed by Holsti's (1969) formula to determine intercoder agreement [C.R.=.80].

[3] Thirty undergraduate subjects participated in the pretest. Item analysis obtained an alpha coefficient of .81.